Daily Reports and Pooled Time Series Analysis: Pediatric Psychology Applications

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Objective: To apply daily reports and pooled time series analysis (PTSA) to issues in pediatric psychology research. We discuss specific applications for this procedure in analyzing repeated observations for a small sample, including medication effects, caregiving role strain, pain reports, and treatment effects.

Methods: In the PTSA example presented, 20 daily behavior reports were provided by parents of 10 children with steroid-sensitive nephrotic syndrome (SSNS) during high-dose steroid administration and tapering.

Results: The full model, including child age, medication dosage, and between-subjects effects, significantly predicted children’s aggressive behavior and anxious/depressed behavior. Steroid dosage significantly predicted aggressive, but not anxious/depressed, behavior.

Conclusions: Daily reports analyzed using PTSA provided insight into serious behavioral side effects of steroid medications used to treat SSNS. We discuss the role of pediatric psychologists in addressing medication side effects and other time-related effects detectable using this methodology.

Key words: pooled time series analysis; within-subjects design; CBCL; prednisone; nephrology.

Many pediatric psychologists work with small numbers of children who have rare, chronic medical disorders. For example, pediatric illnesses such as cancer, cystic fibrosis, and certain gastrointestinal disorders have prevalence rates generally below 1% (Engstroem & Lindquist, 1998; Miller, Jelalian, & Stark, 1999; Powers, Vannatta, Noll, Cool, & Stehbens, 1995). Similarly, pediatric kidney disease, an example of which we use here to demonstrate methodological techniques, affects fewer than 50 children per million annually. However, it is generally agreed that, although rarely occurring, pediatric chronic illnesses merit psychologists’ attention due to their potential impact on children’s developmental experiences and overall functioning. Whereas over two decades of comparing chronically ill and healthy children’s adjustment have informed the research and clinical community on the general impact of pediatric chronic illness, researchers have begun to acknowledge the usefulness of within-subjects approaches in delineating the complexities of an individual’s psychological health (e.g., Bolger, Delongis, Kessler, & Schilling, 1989; West & Hepworth, 1991). In this article, we discuss the unique and valuable contribution that within-subjects approaches using repeated temporal assessments can make in several timely pediatric psychology issues, particularly those related to chronic illness.
In chronic disorders such as kidney disease, cancer, cystic fibrosis, diabetes, migraine headaches, asthma, and inflammatory bowel disease, physical symptoms tend to wax and wane over the course of the illness (e.g., Engstroem & Lindquist, 1998; Greene, Blanchard, & Wan, 1994; Miller et al., 1999). The reasons for this variability often remain unknown or are poorly understood. Similarly, treatments for these disorders, rather than being continuous, may be administered in “bursts” corresponding to symptom change or disease relapse. Thus, assessments of children’s functioning conducted at one or even two time points, though useful for understanding global adjustment, tell little about the impact of fluctuating illness and treatment influences on children’s psychosocial adjustment. An alternative approach, repeated measurement of daily functioning, can provide insight into the unique process of psychosocial adjustment over time when children have chronic illness or psychological disturbance (e.g., Moore, Osgood, Larzelere, & Chamberlain, 1994; Quittner, Opipari, Regoli, Jacobsen, & Eigen, 1992).

In addition to providing greater insight into the complex and unique adjustment challenges associated with chronic physical or psychological illness, repeated temporal assessments and consequent appropriate analysis offer considerable methodological advantages. Cook and Campbell (1979) suggest that these techniques help researchers control for history and maturation, both serious threats to the internal validity of a longitudinal study. Learning more about children's and families' adjustment over time may also prove extremely useful in developing treatment recommendations. By gathering multiple temporal assessments at theoretically and clinically meaningful time points, researchers can better identify specific periods when children are at greatest risk for difficulties and, relatedly, when they may most need intervention. Depending on the specific issue, a repeated measures approach may be more useful and valid for treatment planning than data from global assessments, which may be subject to greater bias than daily reports (e.g., Patterson, 1982).

Unfortunately, until recently the complexity of data sets collected in applied settings containing daily reports was often difficult to analyze. For example, ordinary time series (which has occasionally been recommended) generally assumes more data points than are usually available to clinical researchers (e.g., a minimum of 50 data points). In addition, ordinary time series cannot generalize because it is limited to single cases. Although typical analyses of variance (ANOVA) models can partition variance into between-subjects and within-subjects components, most often they cannot be applied to complex time-ordered research designs such as the one presented here, in which there is variable timing of the independent variable and a high number of observations for each subject. Finally, single-subject analytic techniques (i.e., visual analysis) can become overwhelming when attempting to evaluate continuously collected data highly variable over time. Even though some have argued that nothing clinically useful can be derived from single-subject data not interpretable by visual analysis (e.g., Baer, 1977), Moore and his colleagues were able to show clinically significant patterns in such data that are masked by the variability (Moore et al., 1994).

The purposes of this article are to (1) introduce an underutilized analytic procedure for repeated measures with small sample sizes, that is, pooled time series analysis (PTSA); (2) present examples of instances in which repeated temporal measures of behavior and/or adjustment may be a useful methodology for pediatric psychology researchers; and (3) present an example from our research on the behavioral side effects of steroid medications to demonstrate the utility of collecting daily reports and analyzing them using PTSA.

**Analyzing Daily Reports With Pooled Time Series Analysis**

PTSA relies on a regression approach to examine time-related trends, offering the researcher the possibility of combining data from multiple measurement points from several subjects to examine general time-related effects (Jaccard & Wan, 1993, Ostrom, 1990). Daily reports analyzed via PTSA may offer several considerable advantages to pediatric psychology researchers. In comparing PTSA to MANOVA repeated measures models (which are mathematically related to regression), group means are compared at different time points, and individual differences may produce considerable variability in group means. This variability can lead to inflated error terms and reduced power of statistical tests, of particular concern for small samples (Jaccard & Wan, 1993). Moreover, because PTSA can partial out between-subject variance (i.e., individual differences) and use only within-subject variation, the timing of interventions (i.e., changes in the inde-
pediatric patients’ quality of life: behavior. Of the few published studies on this issue, reports indicate increased symptoms such as depression, anxiety, irritability, restlessness, and sleep and memory disturbances (Bender, Lerner, & Poland, 1991; Harris, Carel, Rosenberg, Joshi, & Leventhal, 1986; Satel, 1990). As steroid medications become more widely used in pediatric conditions, psychologists have an important role in assessing the clinical significance of their behavioral side effects.

Research Example

Our research example involves children with steroid-sensitive nephrotic syndrome (SSNS). SSNS is a chronically relapsing disorder characterized by massive urinary loss of protein (proteinuria) and total body edema. Most children with SSNS have a chronically relapsing disease course. Relapses are most frequently treated with high-dose steroid medications, tapered according to improvements in the child’s condition. About half of children with SSNS relapse frequently, requiring several 8- to 12-week courses of steroids throughout the year. While 95% of children with SSNS outgrow their disease without long-term detrimental effects, the average duration is approximately 10 years (Warshaw, 1994).

Method

Participants

Parents of children with the diagnosis of SSNS were recruited from the Pediatric Nephrology Clinic at Doernbecher Children’s Hospital at Oregon Health Sciences University (OHSU). Fifteen English-speaking families with children ranging from 3 to 16 years old agreed to participate. Five additional families declined participation. Reasons for not participating included lack of time and discomfort completing psychological surveys. There were no apparent differences in age and sex of child, duration of diagnosis, or parent marital status between participants and nonparticipants. The majority of respondents were mothers (87%). Of the 15 parents agreeing to participate, 10 completed the study; 5 did not complete because their child was re-diagnosed as steroid resistant ($n = 1$), or the child did not relapse during the 16-month course of the
investigation \((n = 4)\). Eight (80\%) of the remaining 10 children were male; their mean age was 8.2 years (range: 2.9 to 16.5 years). Nine children were white, and one was African American. Hollingshead (1975) ratings available for nine of the ten children indicated one child in class I (highest), and two children each in classes II, III, IV, and V. The study protocol was approved by the institutional review boards at OHSU and Washington State University. Informed consent was obtained from each child’s parent or guardian.

**Measure and Procedure**

To assess behavioral side effects of prednisone, the Child Behavior Checklist (CBCL; Achenbach, 1991, 1992) was used. The 118-item CBCL provides an age- and sex-standardized assessment of a child’s internalizing and externalizing behavior problems. We chose the CBCL for its applicability to the wide age range of our sample, for its normative data, and because it has been widely used in behavioral research. To minimize parental fatigue, telephone assessments during relapse included only the anxiety/depression and aggression subscales of the CBCL.

To obtain a baseline measure of the child’s behavior, parents completed the full CBCL at a time when their child was in remission, off prednisone, or on low dose alternate day therapy (not more than 0.5 mg/kg/48h). All participants completed baseline assessments at least 6 weeks prior to relapse. At the initiation of daily prednisone for relapse (2mg/kg, divided two times a day), the research staff conducted a series of telephone calls to assess the child’s behavior. A round of five consecutive daily telephone calls was initiated 2 days after starting full-dose prednisone and then repeated every 2 weeks for a total of four rounds of calls occurring during weeks 1, 3, 5, and 7 of therapy for relapse (20 calls total). The prednisone dose was decreased to 2 mg/kg every other day (single a.m. dose) at the time of urinary remission and then tapered approximately 0.5 mg/kg approximately every 2 weeks thereafter. Thus, the timing of behavioral assessments corresponded to the child’s tapering medication schedule, depending on the timing of each patient’s urinary remission. This prospective, repeated measures study design allowed each child to act as his or her own control (baseline vs. relapse behavior) and allowed assessment of dose-related changes in each child’s behavior.

**Results**

**Analyses**

We used two methods for analyzing our study data. For purposes of comparing across subjects of varying ages and gender, T scores were used in all analyses. The first procedure involved analyzing individual participant effects by plotting each individual’s behavior scores by dosage/time. Figures 1 and 2 present examples of graphed scores from four individual subjects. In Figure 1, the linear effect of decreasing behavior problems corresponding to decreasing steroid dosage is apparent for both subjects. Figure 2 presents two subjects for whom, on visual inspection, there appears to be no clearly identifiable pattern of effects between dosage and behavior problems.

In addition, mean scores for high-dose and steroid-free periods were calculated for each individual participant by collapsing the five assessments conducted in each period. During the relapse episode when children were on steroid medication, 70\% \((n = 7)\) had one or more days when their behavioral symptoms were borderline or exceeded clinically significant levels (scores were at or above the 95th percentile). Mean scores decreased from high-dose to steroid free periods in five cases (50\%), as predicted; scores increased slightly for one case,
these specific analyses, we review the issues of primary concern, followed by our results. The following sections are aimed at providing a general overview of the procedure; more detailed technical discussion of PTSA is available in Allison (1994), Ostrom (1990), and Sayrs (1989).

**Data Structure.** In PTSA, data from individual time points are treated as individual cases. For example, the 10 individual children in our study had behavior scores from 20 different time points. In PTSA, each time point for each participant is treated as an individual case; thus, in our example, 10 individuals × 20 measurement points equal 200 “cases.” Thus, the data would be structured such that the researcher would have 200 rows, each with a single variable, rather than 10 rows with 20 variables each (the typical format for comparison of means). In contrast to other techniques, the data structure of PTSA has two particular strengths. First, because it uses a sample of subjects, fewer observations per participant are required than for more familiar strategies, such as traditional time-series. Second, greater statistical power can be developed, even when using small clinical samples, by capitalizing on several observations for each participant. (Because much clinical data have positive autocorrelation, effective sample size is recommended at somewhere between \( N \) and \( \frac{N}{2} \).) One may use data transformation procedures such as TRANSPOSE in SPSS (SPSS Inc., 1994) for existing data sets. Each individual case, identified with a subject code, is then entered into a regression equation. Any data analytic program with linear regression capabilities (e.g., SPSS, SAS), can be used to analyze time-related trends (Ostrom, 1990).

**Between-Subjects Effects.** In PTSA, individual differences are addressed using dummy codes. The total number of dummy codes necessary is \( n - 1 \); for example, in our study example with \( n = 10 \) participants, nine individual difference dummy codes are necessary. These dummy codes absorb overall differences across participants and thereby limit any substantive analysis to change over time, independent of individual differences. Thus, results from PTSA ensure that preexisting individual differences cannot account for any substantive results. (For description on use of dummy coding, see Stephens, 1992.)

**Serial Dependence.** One of the concerns arising in the use of PTSA (or any other procedure including three or more time-sequential measures; Allison,
1994) is observations closer together in time will be more highly correlated than those farther apart (Ostrom, 1990). However, traditional regression analysis requires that error terms be independent, and a fundamental problem in analysis of temporal data is violation of the assumption of independent residuals (Jaccard & Wan, 1993). The effect of this phenomenon, known as serial dependence, is that it can artificially inflate significance estimates. Several available procedures can help correct serial dependence in PTSA.

Perhaps the simplest procedure is to run the regression analysis without correction for serial dependence to obtain an autocorrelation estimate. SPSS, for example, provides an estimate of serial dependence (autocorrelation). This estimate, the Durbin-Watson statistic, is available on the /STATISTICS subcommand of the REGRESSION command. The Durbin-Watson statistic can be transformed to an autocorrelation estimate, \( r \), calculated as:

\[
\begin{align*}
\text{\( r = (2 - \text{dw})/2, \)}
\end{align*}
\]

where “\( \text{dw} \)” refers to the Durbin-Watson value. After obtaining the autocorrelation estimate, all the dependent variables in the analysis are transformed using the formula:

\[
X^t_t = X_t - r(X_{t-1}),
\]

Where \( X^t_t \) is the new version of the variable at time \( t \), \( t \) is the original version at time \( t \), \( r \) is the autocorrelation estimate from the Durbin-Watson statistic, and \( t-1 \) is the time period previous to \( t \). (For further detail on these formulae, see Draper & Smith, 1981; Morrison, 1983; Neter, Wasserman, & Kutner, 1985.) Subsequent regressions are run as “no intercept” (/ORIGIN subcommand under REGRESSION command in SPSS) regressions. A constant is calculated \( (1 - r) \) and is entered as a predictor. According to Ostrom (1990), two iterations of this procedure should be sufficient to correct for serial dependence. It is also possible to test the significance of the Durbin-Watson value (Neter et al., 1985) to decide whether to proceed with further iterations. Although the variable transformation procedure can be tedious, this correction procedure for serial dependence ultimately leads to more trustworthy results (Neter et al., 1985; Ostrom, 1990).

**PTSA Results on Aggressive Behavior.** To control for serial dependence, a first multiple regression was run with the following predictors: child's age (as a control variable), medication dosage (milligrams prednisone/child's weight in kilograms), and dummy codes for individual differences. The Durbin-Watson statistic was used to compute serial dependence (autocorrelation). After transforming variables as described above, including a \( y \)-intercept, subsequent iterations of the procedure were conducted until an autocorrelation estimate of \(-.15\) resulted.

Our final test of this model (child's age, medication dosage, and individual differences as predictors of children's aggressive behavior) was statistically significant, \( F(11, 179) = 1039.43, p = .000 \). In this final equation, the regression weight (\( B \) for medication dosage was \( 2.48, t (179) = 2.89, p = .004 \)). The regression weight indicated that each single unit increment in prednisone dosage (one milligram per kilogram) corresponded to an increase of approximately 2.5 units of aggressive behavior. Parents rated 19 aggressive behavior items as occurring “never,” “sometimes,” or “frequently” on each data collection day. Thus, increases in aggressive behavior units could correspond to increases in either the overall number of behaviors occurring “sometimes” or “frequently” or an increase in the frequency of occurrence of behaviors previously occurring.

In addition, \( R^2 \) values from the original regression were examined to assess the effects of the control variable (child age) and individual difference codes \( (R^2 \) values from the no-intercept regression could not be interpreted in this case due to variance explained by the transformed constant, which was entered on the first step). Child age did not significantly predict aggressive behavior scores, \( F_{\text{change}} (1, 198) = 1.64, p = .202 \). Individual differences did significantly predict aggressive behavior scores, \( F_{\text{change}} (10, 189) = 10.84, p = .000 \).

**PTSA Results on Anxious/Depressed Behavior.** The same procedures used to correct serial dependence in aggressive behavior scores were applied to anxious/depressed behavior. After subsequent iterations, an autocorrelation estimate of \(.27 \) was achieved. The final test of this model (child's age, medication dosage, and individual differences as predictors of children’s anxious/depressed behavior) was statistically significant, \( F(11, 179) = 1430.02, p = .000 \). In this final equation, the regression weight (\( B \) for medication dosage was \( .69, t (179) = 1.56, p = .12 \)). Although not statistically significant, the regression weight indicated that each single unit increment in prednisone dosage corresponded to an increase of approximately \(.69 \) units of anxious/depressed behavior. Child age did not significantly predict anxious/depressed behavior.
Discussion

The within-subjects methodology of using daily behavior reports and PTSA in examining pediatric psychology issues can lead to conclusions relevant to pediatric psychologists and other clinicians. For example, the study example here demonstrated that the CBCL, which has a narrow range of measurement error (Achenbach, 1991), proved to be a useful tool in detecting changes in the 20 daily assessments with each participant. The study design, in which data from a small number of participants could be integrated, is one of the strongest because it provides a true assessment of change while controlling for individual differences, history, and maturation (Cook & Campbell, 1979). The statistical controls we employed help us have more confidence in the results of our study example. Moreover, because PTSA provides regression coefficients, we also have effect sizes directly related to our clinical question of interest.

Clinicians working with pediatric patients who take prednisone often have the impression of serious medication-related side effects. In our study, those impressions were partially supported. PTSA results indicate that children experience significant elevations in reported aggressive behavior related to increased prednisone dosage. However, anxious/depressed behaviors were not significantly predicted by medication dosage. Although previous studies have reported prednisone-related psychological disturbances, they had methodological problems that preclude drawing firm conclusions regarding prednisone’s behavioral effects. In particular, inadequate information on dosage and duration of medication exposure make it difficult to understand the precise nature of prednisone’s potential dosage-related side effects (Satel, 1990). Using within-subjects repeated measures methodology, we were able to tease out the nature of the increase in behavior problems relative to increase in steroid dosage for two separate behavioral dimensions. Drawing these conclusions would not have been possible had we elected to use assessments at only one or two time periods.

At this point, our use of two different analytic techniques merits discussion. Whereas our PTSA results suggest a medication-related effect on behavior over time for the entire group, visual analysis of individual subject data graphed over each assessment period (examples presented in Figures 1 and 2) indicates that high-dose steroid administration had identifiable effects on the behavior of some participants, but not all. In fact, approximately 40% of participants had no clear pattern of dosage-related behavior change identifiable by graphic presentation. To some degree, our visual inspection supports the suspicion that group designs can mask important individual differences. However, one could erroneously conclude, based on graphs from individual subjects such as those in Figure 2, that there is no association between steroid dosage and behavior problems. We therefore propose that clinicians are likely interested in the effects of medications (or psychosocial interventions) on groups of children as well as on individuals, and both visual analysis and PTSA are useful techniques to address the respective concern.

Whether we choose to base conclusions from our results obtained via PTSA or visual techniques, repeated assessments helped illuminate the process of these children’s adjustment over time. Specifically, eight (80%) of the children had CBCL scores in the nonclinical range at baseline (i.e., a prednisone-free data collection point at least 6 weeks prior to relapse and medication initiation). During relapse, five of eight children with normal baseline scores (mean T = 62.5) had CBCL scores above the 95th percentile for age and gender during at least one of the calling periods. Of these children, three had elevated scores on both CBCL subscales, three had elevated scores for aggressive behavior only, and one child had an elevated score for anxiety/depression only. The two children who had elevated scores at baseline also exhibited increased behavior problem scores during relapse. Again, the nature of the process of treatment-related behavioral change was detectable only by using this repeated measures methodology.

From a clinical perspective, findings such as these indicate specific risk periods for elevated behavioral problems that families and affected children need to know. As treatment regimens for disease relapses such as SSNS and other illnesses are often stretched out over several weeks or more, it is important to provide families anticipatory guidance related to potential steroid-induced effects. Families should receive additional support during periods when their children are at risk for side effects of significant concern. Appropriate anticipatory guid-
naire could allow families to be better prepared for behavior problems both at home and at school.

From a research perspective, we acknowledge the possibility that, in parents who report elevated behavior problems, their children’s behavior might have improved merely as an effect of support they perceived resulting from the frequent phone calls required for participation in this study. Although the investigators stressed that the purpose of the calls was for research only, parents may have found that frequent reporting on their child’s behavior provided some relief for perceived difficulties. Other researchers have reported intervention-related decreases in child behavior problems over the course of daily phone calls (Chamberlain, Moreland, & Reid, 1992). As a result, it has been suggested that nondirective phone contact acts as a form of support for parents’ perceived behavioral symptoms in their children, especially for children with high rates of behavior problems. Therefore, whether decreases in reported behavior problems were linked solely to decreased medication dosage remains to be determined.

In addition, although we did not tell parents we were collecting medication dosage-related information, they likely determined this by the schedule of our phone calls. As parents became aware of the correlation between phone call timing and their children’s medication schedule, they may have expected medication-related changes. Such an expectancy phenomenon has been described for other behavioral symptoms. In fact, the symptoms parents observed may have been normal daily variations in their children’s behavior. However, in examining descriptive data on the entire group, approximately 30% of participants reported little behavior change over the course of the phone calls, thus raising doubt about a general response bias. Also, as discussed earlier, previous research by Patterson (1982) and others suggest that daily reports are significantly less biased than parental reports asking parents to aggregate perceptions over longer time periods such as weeks or months. The forces behind parental perceptions of child behavior, whether medication-based, psychosocial, or a combination of the two, remain to be explored.

Limitations

Limitations of PTSA. Our goal is to provide a sound method for gathering and analyzing data in small n situations, particularly to examine psychosocial phenomena in rarely occurring pediatric chronic conditions. The reader should be aware that even though PTSA offers considerable advantages in analyzing data from small samples, like any other analytic procedure, it has limitations. Primary among PTSA’s limitations is its capacity to handle nominal/ordinal individual-difference variables. Two consistent concerns in pediatric psychology are age- and gender-related effects. Unfortunately, PTSA cannot address effects of nominal variables. If the researcher can collect data from a sufficient number of each gender, data can be analyzed separately. If time-related effects are linear, follow-up tests of regression coefficients can be conducted (Cohen & Cohen, 1983). Another concern is age-related effects. While the researcher can control for age-related effects, significance tests of age-related effects can be misleading, as their influence is overestimated by the percent variance accounted for in the final equation (Johnson, 1995).

More sophisticated procedures such as hierarchical linear modeling, latent growth curve analysis, and latent transition analysis can address nominal/individual difference variable effects. In addition, these modeling procedures allow for detection of systematic trends for missing data effects. In addition, these modeling procedures allow for detection of systematic trends for missing data, which may occur, given the intensive nature of many repeated-measures designs applied to clinical populations. These procedures offer several advantages over PTSA, but they typically require sample sizes substantially larger than the one used in this study (or than are commonly available in single-site studies of rarely occurring pediatric chronic illnesses).

Limitations of This Study. The data used to demonstrate use of repeated measures (daily report) methodology and PTSA helped illustrate the major methodological concepts. However, as in any study, limitations of the results must be acknowledged. First, there is a potential confounding effect of illness symptoms on the outcomes (aggression and anxiety/depression). When children with nephrotic syndrome relapse, they are prescribed steroid medications presumably corresponding to symptom severity. Medication dosage is decreased corresponding to improvement in the child’s condition. One could interpret the reduction in behavioral symptoms as relating to decreased illness severity rather than corresponding to decreased medication dosage, as we reported. Although it is unlikely that increased severity of illness caused behavioral changes of the magnitude reported in this study, it is possible that discomfort from disease-related symp-
toms such as edema may have contributed further to elevated behavior problems. One way to tease out the effects of medications versus disease symptomatology would be to assess a comparison sample of children taking medications other than high-dose steroids. In some cases, children’s disease symptoms do not respond to steroids (i.e., steroid-resistant), and after controlling for other illness variables, this population may constitute an appropriate comparison group.

Another limitation of this study was its sample size. As mentioned previously, effective sample size for PTSA is recommended to be somewhere between $N$ and $N \times O$, that is, somewhere between 10 and 200 for this study. Thus, our sample of 10 was at the lower limit of acceptability for PTSA.

**Conclusions**

Within-subjects design with repeated temporal assessments was presented as a potential tool for examining pediatric psychology issues such as caregiving role strain, pediatric pain, treatment effects, and medication side effects. Moreover, these methods can help researchers exploit important clinical data related to low incidence disorders by, for example, maintaining the use of $n = 1$ methodology and its scientifically compelling aspect of replication. These methods also allow researchers to study naturally occurring clinical events or events that rely on timing and clinical judgment. Thus, it could even allow the pooling of data across settings, which would allow a more natural and rapid collection of data on clinical cases or events that have naturally low base-rates. Finally, results from the study example presented here provide applied evidence of the research and clinical utility of the procedures we described. Our goal is to make the methodology we presented accessible for researchers and clinicians to gain greater insight into pediatric psychology concerns.

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